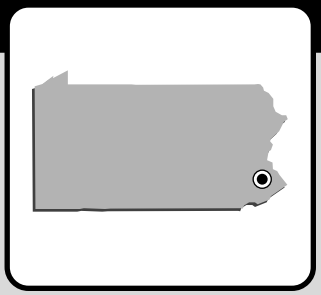
WARMINSTER NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION
WARMINSTER TOWNSHIP, PENNSYLVANIA



Engineering Field Division/Activity: NORTHDIV

Major Claimant: COMNAVAIRSYSCOM

Size: 818 Acres

Funding to Date: $7,109,000

Estimated Funding to Complete: $31,568,000

Base Mission: Research and development for Naval aircraft systems, antisubmarine warfare systems and the associated computer software

Contaminants: Firing range wastes, fuels, heavy metals, industrial wastewater sludges, non-industrial solid wastes, paint, PCBs, sewage treatment sludge, solvents, unspecified chemicals, volatile organic compounds

Number of Sites:		Relative Risk Ranking of Sites:			
CERCLA:	9	High:	8	Not Evaluated:	0
RCRA Corrective Action:	0	Medium:	1	Response Complete:	1
RCRA UST:	1	Low:	0	Total Sites:	10
Total Sites:	10				

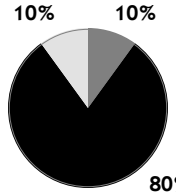
NPL

BRAC II

EXECUTIVE SUMMARY

Warminster Naval Air Warfare Center (NAWC) is in Warminster Township, Bucks County, Pennsylvania. The installation was commissioned in 1944 as the Naval Air Development Center. The mission is research, development, testing, and evaluation for Naval aircraft systems. Studies are also conducted in antisubmarine warfare systems and software development. Past operations include aircraft maintenance and repair, pest control, fire-fighting training, machine and plating shops, spray painting, and various materials research and testing activities. Wastes generated include paints, solvents, industrial wastewater treatment sludge, and waste oils. In 1979, Volatile Organic Compounds (VOCs), primarily the organic solvents TCE and PCE and metals were detected in local groundwater wells. In 1980, the Navy began a study of contaminated waste disposal sites at the base under the Naval Assessment and Control of Installation Pollutants (NACIP) program. In the early 1980's, there was some speculation that the presence of the organic solvent TCE in the groundwater was causing birth defects in the area which was accompanied by media coverage. A survey conducted by the Health Department concluded the birth defect rate was within the normal statistical range. Numerous local drinking water wells have been taken out of service due to the spreading contamination, including wells on NAWC. NAWC Warminster is an Interim Status Treatment, Storage and Disposal Facility (TSDF) under the RCRA statute for hazardous wastes. Controlled under this permit are two industrial waste storage impoundments, one storage building and one waste oil Underground Storage Tank (UST). NAWC was placed on the NPL in 1989 due to potential groundwater contamination. A Federal Facility Agreement (FFA) was signed in September 1990.

NAWC lies in the Delaware River drainage basin. Surface runoff empties into the Delaware River, which is about 10 miles away. Bedrock underlying NAWC belongs to the Stockton Formation, which is dominantly sandstone with occasional layers of shale. The top layer of bedrock is typically extensively weathered. Due to the high permeability of the weathered rock layer, the greatest migration pathway is laterally through the weathered zone. Contaminants can be carried by this lateral flow until the groundwater is either discharged to streams, or dispersed into joints and fractures. Contaminant migration pathways are surface water, soil, soils to groundwater, and groundwater, potentially affecting both human and ecological receptors.



Current Status Of Sites

Studies Underway	1
Cleanups Underway	8
Response Complete	1
TOTALS	10

A Technical Review Committee (TRC) was formed in April 1988 and converted to a Restoration Advisory Board (RAB) in December 1993. The RAB has 15 members and they meet on a monthly basis. Although the public was involved with the TRC, the new RAB has proven to be more effective in community outreach and soliciting community involvement. An Information Repository is available to the public at the Bucks County Public Library in Doylestown, Pennsylvania.

At the end of FY95, only one site was still in the Study Phase. Eight sites were in the Cleanup Phase. UST 1, an UST that contained heating oil, is Response Complete (RC). The tank and surrounding contaminated soil have been removed. A Record of Decision (ROD) for extraction and treatment of groundwater will be completed at Operable Unit (OU) 3 in FY96. Remedial Action (RA) should then be completed. In FY97 at Site 9 (Area D), an RA of a pump and treat system for groundwater is expected to be completed. An RA for extraction and treatment of groundwater will be completed in FY97 for OU 1. OUs 1 and 3 will also begin Long Term Monitoring (LTM). These actions will reduce the risk at these high risk sites.

In April 1993, off-base residential well sampling indicated groundwater contamination in two neighborhoods. Working with the EPA, the Navy installed water treatment systems for over 50 private homes with contamination greater than drinking water standards. Connections to the local municipal water system were completed in 1994. This action removed potential health risks to the local community.

NAWC Warminster was included on the 1991 Base Realignment and Closure (BRAC) list for realignment. The property was divided into eight parcels, with 393 acres identified as Community Environmental Response Facilitation Act (CERFA) clean. The 1995 BRAC Commission recommended NAWC for closure. Operations will be transferred to NAWC Patuxent River, Maryland, in September 1996. The closure date is anticipated to be March 1997, but the final property transfer date has not been determined. About 100 acres of the property will be retained by the Navy.

The BRAC Cleanup Plan (BCP) and an Environmental Baseline Survey (EBS) Phase I were completed in FY94. A Phase II EBS is planned for the future. The Final Draft Land Reuse Plan is being reviewed. The BRAC Cleanup Team (BCT) has been established.

WARMINSTER NAWCAD
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - NAWC lies in the Delaware River drainage basin. Surface runoff empties into the Delaware River, which is about 10 miles away. No constantly flowing streams course through the NAWC property. Intermittent streams are tributaries to Little Neshaminy and Southampton Creeks, which are used for light industrial purposes. Drainage patterns from the NAWC are radial with respect to the topographical high which bisects the property along the main east/west runway. Bedrock underlying NAWC belongs to the Stockton Formation, which is dominantly sandstone with occasional layers of shale. The top layer of bedrock is typically extensively weathered. The weathered rock ranges from 8 to 25 feet thick. Soils in the vicinity are dominantly silt loams.

Depth to groundwater ranges from 2 to 14 feet below the land surface. A saturated zone is typically located at the base of the layer of weathered bedrock. Due to the high permeability of the weathered rock layer, the greatest migration pathway is laterally through the weathered zone. Contaminants can be carried by this lateral flow until the groundwater is either discharged to streams, or dispersed into joints and fractures. Water is supplied by seven on-site wells. Three other existing wells are contaminated with the organic solvents TCE and PCE and are not used for potable water. The Warminster Municipal Authority supplies potable water to an enlisted men's housing development, and to all other areas within a three mile radius of NAWC. In June 1993, the Navy provided bottled water, filtration systems, and city water system hookups for two residential areas due to the presence of the organic solvent TCE contamination in drinking water wells.

NATURAL RESOURCES - The airfield provides a large open field habitat for many terrestrial mammals and birds. There are also small wooded areas bordering the airfield that provide habitat and cover.

NAWC is divided between two drainage basins. There are two small tributaries of Little Neshaminy Creek to the north and headwaters of Southampton Creek to the south. Both local basins lie within the regional basin of the Delaware River.

The Western Fork tributary originates from a stormwater culvert. Surface water runoff from Sites 1-3 and portions of the airfield enter the stream. The stream bank on Navy property is vegetated with wildflowers, vines, and shrubs and a small forested wetland. Biota observed or expected within the stream and banks include invertebrates, small fish, reptiles, amphibians, birds, and mammals.

The Eastern Fork tributary originates about 200 feet north of Site 4. This area of the stream provides excellent habitat for a large variety of wildlife before flowing north through small woodlots and subdivisions. The origin also receives surface water runoff from an intermittent stormwater drainage ditch from Site 8. The drainage ditch is primarily bordered by maintained lawns, gravel and blacktop. The headwaters of Southampton Creek originate about 1,000 feet from the southeast boundary of the base via a storm sewer. Groundwater and surface water flow and runoff from Sites 5-7 are generally towards this area. The creek then flows through a subdivision and subsequent wooded wetland corridor to Pennypack Creek. The wooded areas provide habitat for birds, reptiles and amphibians, and mammals. Surface water and sediment sample results from these streams exceed ecological screening level criteria.

No known threatened or endangered species are present. Contaminated groundwater affects the Stockton Formation aquifer, which provides water for over 100,000 persons within 3 miles of NAWC. Local surface water bodies are used for recreation and industrial purposes.

RISK - Human Health Risks calculated following EPA Risk Assessment Guidance exceed risk goals for hypothetical groundwater exposure scenarios (ingestion, inhalation and dermal absorption from showering). Residents receive municipal water. Risks associated with dermal exposure to sediments and incidental ingestion of surface water for children wading in the tributaries of Neshaminy Creek and Southampton Creek have also been identified. Fate and transport analysis required to determine site contributions and additional risk evaluation are in progress.

Of the nine CERCLA sites, one received a medium risk ranking and eight received high risk rankings under the Department of Defense (DOD) Relative Risk Ranking System. The high rank was determined by groundwater contamination for each of the eight sites ranked high. Contaminants include paints, oils, solvents, and metals. Groundwater will soon be undergoing treatment at all high risk sites.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - The installation was proposed for the National Priorities List (NPL) in 1986 with a Hazard Ranking System (HRS) score of 57.93. It was listed on the NPL in October 1989. A Pre-Record of Decision (ROD) for Sites 1-8 was signed on 4 October 1989.

LEGAL AGREEMENTS - A Federal Facility Agreement (FFA) was signed between the Department of the Navy (DON) and EPA on 20 September 1990. Operable Unit (OU) 1 was identified in December 1992 as containing Sites 1-3 and 5-7. The OU was addressed in a ROD signed in September 1993 for an interim remedy of a pump and treat system to treat groundwater.

PARTNERING - Successful partnering between the BRAC Cleanup Team (BCT) and the Restoration Advisory Board (RAB) resulted in compressing a project schedule to 15 months for study, design, and construction cost negotiations for the pump and treat system at OU 3. Another successful partnering effort between the BCT and the RAB was an RA for residential wells contaminated with the organic solvent TCE. A task order under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract was immediately started by Naval Facilities Engineering Command (NAVFAC), Northern Division (NORTHDIV). The Navy distributed bottled water, installed temporary treatment systems on each affected well, and then coordinated with EPA and the local water authority to install water service to the residential areas. The quick teamwork by the BCT, RAB, and NORTHDIV was significant in gaining credibility with the community.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - A Technical Review Committee (TRC) was formed in April 1988. They met regularly to address cleanup issues. The TRC was converted to a Restoration Advisory Board (RAB) in December 1993. The RAB has 15 members and they meet on a monthly basis. Although the public was involved with the TRC, the new RAB has proven to be more effective in community outreach and soliciting community involvement.

COMMUNITY RELATIONS PLAN - The Community Relations Plan (CRP) was drafted in FY90 and was updated in FY94.

INFORMATION REPOSITORY - An Administrative Record was established in December 1993. A copy of the Administration Record documents are contained in an Information Repository located at the Bucks County Public Library in Doylestown, Pennsylvania and at the Environmental Branch of the Public Works Office at NAWC and at NORTHDIV.

WARMINSTER NAWCAD

BASE REALIGNMENT AND CLOSURE

II **BRAC** - NAWC Warminster was included on the 1991 Base Realignment and Closure (BRAC) list for realignment. The property was divided into eight parcels, with 353 acres identified as Community Environmental Response Facilitation Act (CERFA) clean. The 1995 BRAC Commission recommended NAWC for closure. Operations will be transferred to NAWC Patuxent River, Maryland, in September 1996. The closure date is anticipated to be March 1997, but the final property transfer date has not been determined. About 100 acres of the property will be retained by the Navy.

BRAC CLEANUP TEAM - The BRAC Cleanup Team (BCT) has been established and includes representatives from NORTHDIV, EPA Region III, and the Pennsylvania Department of Environmental Protection (DEP). The BCT works closely with the Bucks County Economic Adjustment Committee, the newly formed Federal Lands Reuse Authority of Bucks County and the Bucks County Commissioners to set goals and prioritize the remaining work.

DOCUMENTS - The BRAC Cleanup Plan (BCP) and an Environmental Baseline Survey (EBS) Phase I were completed in FY94. A Phase II EBS is planned for the future. A Final Draft Land Reuse Plan is currently being reviewed. The Environmental Condition Of Property (ECP) was developed using an EBS conducted by NORTHDIV and supplemented with additional information obtained through discussions with EPA Region III. These figures have not received regulatory concurrence. Additional information (aerial photographs, archive drawings and employee interviews) has recently been obtained and the EBS will be expanded to include this information.

Environmental Conditions of Property Classification						
1	2	3	4	5	6	7
353 acres	7 acres	0 acres	0 acres	7 acres	7 acres	359 acres

LEASE/TRANSFER - Currently, 160 acres are being leased on an Agricultural Outlease. Approximately 25% of the property is currently eligible for transfer by deed. The remaining property requires further evaluation.

REUSE - A county reuse committee was formed to develop a Land Reuse Plan for Warminster, and to address social and economic issues. The Final Draft Land Reuse Plan is being reviewed.

FAST-TRACK INITIATIVES - Implementation of a pump and treat remedy for OU 3 is proceeding on a fast track basis with construction being awarded almost concurrent with the signing of the ROD.

HISTORICAL PROGRESS

FY85

Sites 1-9 - An Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA) and a Confirmation Study (CS), equivalent to a Site Inspection (SI) was completed that identified nine sites as potentially contaminated. The Stockpile, originally called Site 9 was found to be a mound of clean native soil with no contaminants. Site 9 was recommended for No Further Action (NFA) and closed out. The other eight sites were recommended for further study under a Remedial Investigation/Feasibility Study (RI/FS).

FY86

UST 1 - This Underground Storage Tank (UST) site was identified.

FY87

UST 1 - A leaking 1,000 gallon heating oil tank was removed.

FY90

UST 1 - Contaminated soil was removed and the site was closed out. No further UST remediations are expected.

FY91

Sites 1-8 - Phase I of the Remedial Investigation (RI) was completed.

FY93

Sites 1-3 and 5-7 - In June 1993, the Navy provided bottled water, filtration systems, and city water system hookups for two residential areas due to the presence of the solvent TCE contamination in drinking water wells. These sites were assessed under an extended RI/FS Work Plan. The RI/FS was completed. A Record of Decision (ROD) was signed for a groundwater extraction and treatment system.

FY94

Sites 4 and 8 - The RI/FS for groundwater was completed.
Sites 1-3 and 5-8 - The Remedial Design (RD) for groundwater was completed.

PROGRESS DURING FISCAL YEAR 1995

FY95

A Phase II Environmental Baseline Survey (EBS) was initiated and completed.

Sites 4 and 8 (OU 3) - The ROD for extraction and treatment of groundwater, and the final Remedial Action (RA), was signed.

PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Site 9 (Area D) - An RI/FS is expected to start for this new site.
Site 4 - An RD is expected to be completed.
Sites 4 and 8 (OU 3) - An RA is expected to be completed.

FY97

Site 9 (Area D) - An RA of a pump and treat system for groundwater is expected to be completed.
Sites 1-3 and 5-7 (OU 1) - Completion of an RA for extraction and treatment of groundwater is expected.
OUs 1 and 3 - Long Term Monitoring (LTM) is expected to begin.

WARMINSTER NAWCAD
PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	9							
SI	9							
RI/FS		1	8					
RD			1	8				
RA			1	8				
IRA			6(6)	1(1)				
RC				3				6
Cumulative Response Complete				33%				100%

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC	1							
INV								
CAP								
DES								
IMP	1							
IRA	1(1)							
RC	1							
Cumulative Response Complete	100%							